



ROBOSPHERE 2002

CALL FOR ABSTRACTS



Robosphere 2002, a workshop on Self Sustaining Robotic Ecologies, will be held at NASA Ames Research Center Nov 14-15 2002. This is the first workshop in this area sponsored by NASA Ames and by the Research Institute for Advanced Computer Science (RIACS). Its purpose is to explore the notion of self-sustaining robotic ecologies for long-term or continuous robotic presence on planetary surfaces or in space. Self-sustaining robotic ecologies offer the possibility of increasing scientific returns, decreasing exploration costs and reducing chances of mission failures.

The number of participants will be limited. To request an invitation to the Robosphere workshop please submit an extended abstract (3 to 5 pages) or a statement of interest. Abstracts and statements will be submitted by email as plain text, MS Word or PDF attachments to robosphere-submissions@email.arc.nasa.gov Submission deadline and registration information will be posted on the web site <http://robosphere.arc.nasa.gov>.

Accepted extended abstracts will be printed in workshop proceedings. At the discretion of the program committee some authors will be asked to present their work and a selected number will be invited to prepare full length papers for inclusion in a volume to be published after the workshop.

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Topics of interest include:

Long duration explorer robots on Mars or the Moon

- Mechanical challenges
- Energy
- Sheltering

Small robotic teams capable of mutual repair

- Modular robotics
- Reconfigurable robotics
- Self-repair, recycling and self-replication

Robotics outposts

- Functional specialization
- Energy production
- Shelter construction (for robots)
- Utilization/production of parts

Planetary robotic infrastructures

- Robotic oases
- Robotic highways
- Robotic factories
- Scientific exploration infrastructure
- Communications/networks

Robotic colony autonomy

- Distributed planning and scheduling
- Mixed-initiative planning
- Distributed execution monitoring and diagnosis
- Self-organization and cooperative strategies
- Colony models from biology and ecology, swarms
- Robotic ecologies with different scales
(from rovers to nanobots)

New mission concepts

- Bringing parts
- In situ exploration staging
- Failure resistant planetary exploration

Beyond Mars, Moon and Earth Orbit

- Creating other planetary outposts
- Robotic colonies for asteroid mining and small body exploration
- Packaging robotic colonies for deep space travel

Robot ecologies for large-scale orbital construction

- Solar power satellites
- Large aperture observatories
- Orbital colonies

Robotic infrastructure in preparation for human exploration

- Common needs for robotic and human survival
- Tested energy sources
- Enhanced safety

Earth based development and testing

- Robosphere1: An Earth based robotic ecology environment
- Virtual Robosphere1
- Internet outreach

